Of Publishing Scientific Papers

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Contents

Preface

This essay with illustrations was presented as the Presidential Address at the meeting of the Central Society for Clinical Research on October 30 1953 in Chicago Because of its nature and in response to many requests it is being published separately so that it may be available to others

The editorial assistance of Miss Lois DeBakey in the preparation of the manuscript is gratefully acknowledged The assistance of Mr and Mrs Roy Robinson who drew the illustrations is also recognized The privilege for republication of this material granted by the C V Mosby Company of St. Louis Missouri is sincerely appreciated

To CRYSTALLIZE SUCCESSFULLY one s researches into a concise lucid well organized and well illustrated paper is an achievement limited to few investigators Such a publication results in intellectual gratification to both author and reader To read and study well written papers is a joy for which the reader is always appreciative

A good scientific paper first, contains new data well oriented among those already in the literature and, second accurately evaluates the new contributions It indicates the purpose of the investigation, describes the experiments and presents precisely the origin of the ideas The results are summarized clearly but without modification selection or elimination of data for the purpose of reaching preconceived prejudiced or apparently acceptable conclusions The arguments by which the interpretations were logically and clearly made are included in the paper to permit the readers to judge all aspects If the investigation has been properly conducted and if the methods are adequately described the experiments may be repeated by others and within the limits of existing knowledge essentially the same interpretations can be achieved. Furthermore the disciplinary effect of taking periodic inventory in research by writing for publication has its scientific rewards to the investigator and alone is sufficient to make obligatory the writing but not necessarily the publishing of scientific papers in research

It should be noted that whereas medical science has progressed and the medical literature has expanded considerably, methods of publication have not enjoyed commensurate development, improvement and attention. A critical review of some aspects of present-day practices in medical writing may be helpful, even though adequate solutions for current problems, errors and deficiencies are not offered. It is hoped, nevertheless, that these reflections may provoke critical and corrective meditation among those concerned directly and indirectly with medical writing.

The investigator-author is *primarily responsible* for the production of the paper. The long succession of others concerned with its production, including benefactor, institution, editor and publisher, should insist on a superior product and should aid the author in every way to accomplish this end. Like his researches, the investigator's writing should be initiated spontaneously to disclose to the scientific world scientifically accurate and [illegible] ideas [illegible] The investigator should be [illegible] conversant [illegible] knowledge of the literature and his own research [illegible] minimal requirements for his [illegible]

1 The Self Plagiarist

considered an ethical medium for propagandizing one's self (FIG. 1.) Self plagiarism signifies lack of scientific objectivity and modesty. For enhancement of significance and to become established, scientific observations should be corroborated by others, not by one's self. Priority accompanies the earliest publication and not acquired or more firmly established by repeated publications of essentially the same data.

2 The Self Aggrandizer

Writing in science to be fashionable to qualify for membership in a society or for academic and financial advancement or self glorification is unpardonable (FIG 2) These personal gains constitute the inevitable reward of commendable work not the goal True scientific writing cloaks a humble modest character Papers solicited especially under pressure by friends editors of journals or medical societies are likewise rarely of maximal quality



3 Tubular Vision

Regardless of origin all previously published reports must be reviewed before the investigator may consider his data original. (FIG 3) Failure to establish the accuracy and originality of one s own data, with proper perspective

The author should be permitted to present his observations and ideas which constitute the nucleus of any scientific paper in his own style without major alteration by publication policies or editorial disciplines The scientific character of a man is identifiable in his writing and often assists in evaluation of his work by others. To be sure a good literary style is enviable, but experimental and scientific inadequacies can be deceivingly cloaked in literary eloquence For the true investigator research is an addiction from which his mind cannot peacefully escape He is forever objectively observing and analyzing events about him, and these experiences should be recorded in his own best fashion

within the whole scientific framework reflects lack of scientific maturity Only the absolute truth can be tolerated in science no compromise is permissible. There is no substitute for observation by scientific methods as the final test in establishing a scientific truth Furthermore the application of elaborate graphs charts mathematical tools or eloquent language to inaccurate data cannot render them valid. Fortunately the informed critical and capable reader is rarely misled Publications which are unreliable are to be condemned Similarly the investigator who is prone to claim or to imply cures for disease states without providing conclusive evidence should be censured The recent medical literature on chronic disease is replete with such examples The energies of many men expended in disproving false claims could be devoted to more positive endeavors

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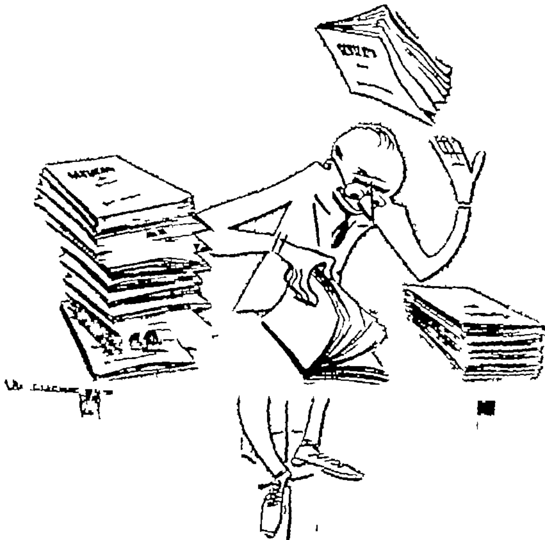
Scientific ability should be judged by the *quality* not the *quantity* of the publications (FIG 4) It is likewise unsound for the inactive investigator to rationalize his sterility by the proclamation that extensive writing cannot be of high quality Scientific writing like scientific data must be judged on its own merits through careful study To a fortunate few research comes with the apparent ease of a craft to the professional craftsman Shakespeare s writings prolific though they were are not considered inferior nor is the work of Gauss considered poor because his interests were so extensive

Papers should be constructed to facilitate reading Only clear definite statements should be presented Remember that the writer has all his data whereas the reader has only those presented to him and in a fashion chosen by the author All sentences therefore should lucidly convey to the reader the precise thoughts and images in the mind of the writer All pertinent data should be included especially the method of study which with present-day emphasis on brevity is unfortunately often not described in detail By reviewing the original data the experienced investigator can properly evaluate a presentation Furthermore the experimental details should be made available to those who wish to repeat the experiments a privilege frequently denied colleagues today Accuracy and thoroughness can never be sacrificed in writing

THE READER of scientific papers as the audience of the writer should discharge with diligence the important responsibility associated with the privilege of reading scientific papers He should tolerate neither inaccurate and unfounded data nor careless interpretations and discussions He should study the papers analytically critically and with the devotion to scientific thought that he would exercise were he himself producing an article from the data available in the paper For proper evaluation papers in science must be examined like a document, carefully deliberately objectively and without prejudice or emotion A scientific paper must be studied not read Just as there are few men who can do scientific work well and write properly there are few who have the attributes for proper study of scientific papers Only after deliberate examination is one capable of satisfactorily evaluating the paper and thus entitled to the privilege of criticizing it (FIG 5) Then he should express his opinions whether laudatory or deprecatory



5 The Critic



6 The Scanner

Readers are frequently eager to comment strongly about the merits of data and papers which they have not examined carefully (FIG 6) Criticism should be the privilege of those who have more than cursory impressions



7 The Summary Addict

Clinical papers should also be read carefully especially those concerned with new ideas in therapy Such analysis would preclude many erroneous contentions from progressing beyond the publication stage The practice of reading the summary alone often written on the basis of a few cases with apologies but with implications of finality

frequently results in general use of the ideas by the reader rather than a demand for more conclusive data from the same author to establish the truth (FIG 7) The reader should employ his imagination to the utmost when studying a paper but that must be recognized as his contribution to the advancement of the scientific literature

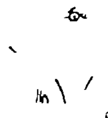
One must be fully informed on a subject to be capable of adequate criticism Mathematical expressions and other such auxiliary tools including the significance of the assumptions in the interpretations must be understood by the reader However unless sufficient details of method and original data have been presented by the author the reader is obliged to accept or discard results interpretations and conclusions on the basis of his confidence in the investigator or *apparent* reasonableness of the presentation Without adequate data the reader is furthermore deprived of the most interesting aspect of study of the paper i e critical reading which like critical discussion, leads to scientific advancement. To read critically is to conduct a critical conference with the author who has committed himself in writing

THE BENEFACTOR *university* and *other similar sponsors of research* also have an important responsibility in scientific writing and that is to provide guidance and assistance in producing only publications of the highest quality This can best be fostered by granting unlimited freedom and support to the capable investigator in his research and writing regardless of the immediate practical aspects of the studies He should therefore never be prodded for premature publications (FIG 8) Institutions should refrain from evaluating the investigator and the quality of his publications on the basis of the uninformed layman s response or of general acclaim or condemnation (FIG 9) That a scientific truth cannot be established by public opinion is evidenced by the experiences of Gallileo when he declared that the earth was round



8 The Prodder











APPLAUSE METER

9 The Evaluator

THE JOURNAL EDITOR and all his assistants (FIG 10) also bear an important responsibility in medical publications Their qualifications should include scientific knowledge irreproachable scientific interest objectivity industry critical judgment and ability to write scientifically themselves They should be scientifically humble unprejudiced intellectually honest and concerned with aiding not retarding the advancement of science or the investigator The editor and his assistants should conduct themselves in a fashion to indicate interest in assisting the investigator and not in impeding him Policies should never be established by edict Nor should the editor criticize methods data analytic procedures or interpretations after only cursory perusal of a paper to which the investigator has devoted hours of thought and laboratory research (FIG 11) Only the investigator can write accurately about his own scientific experiences Above all the slightest modification regardless of its apparent lack of significance should be approved by the author



10 The Editor and his Board

11 The Censor

The editor should exercise his convictions and opinions not dogmatically but humbly conservatively and in an unbiased courteous though positive manner When the merit of a paper remains dubious in the minds of the editor and capable consultants, he should so inform the investigator who should then be given the opportunity of publishing the paper if he wishes allowing the readers and the test of time ultimately to establish the merits of the data and interpretations

A capable editor on the other hand, is quick to recognize the scientific charlatan He is sufficiently perceptive to detect readily papers inadequately oriented in the existing stage of knowledge and to recognize self plagiarism borrowed material, poorly substantiated conclusions and disorganized presentations.

Ideally any member of the editorial board should be qualified to serve as editor Not retired scientists, but active vigorous investigators should hold these appointments (FIG 12) They should not be like inhibitors but catalysts It is they and the editor and not the editorial committee who should be primarily responsible for adoption and execution of all important policies of the journals A good editorial board should manage and direct administrative activities of the journal The greater division of responsibility and authority the poorer the service to science for responsibility without authority can only result in failure.



12. The Man of Distinction



13 The Board-o philiac

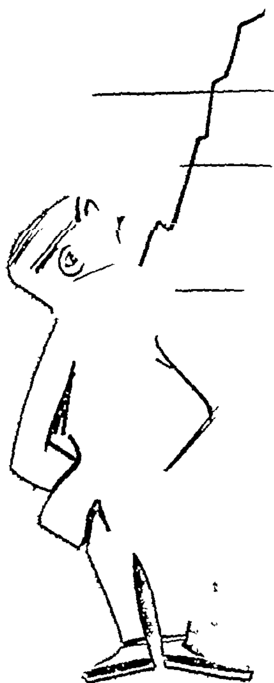
The individual who appreciates fully the responsibilities of an editorial board will accept appointment to only one or two journals to which he can devote the necessary time to perform a good service (FIG 13) Those who are too occupied with other endeavors far removed from active participation in research and critical scientific thought and who hold appointments on editorial boards in name only act as window dressers Appointment to an editorial board for purposes of self-glorification rather than for superior scientific and editorial abilities is an

affront, not an honor The dictatorial editor whose editorial board functions as mannequins and who makes most of the important decisions himself is extremely limited in his accomplishments (FIG 14) In general, then the usefulness of a member of an editorial board is inversely and exponentially related to the number of journals he serves The influential or important people who are appointed to editorial boards for economic or medical political rather than scientific, reasons more honestly belong in the category of Editorial Sponsors —analagous to civic leaders who sponsor municipal philharmonic societies Such a body would however seem to have a limited place in the field of true science It should always be remembered that the investigator and his scientific data are of paramount not secondary importance to editors boards committees, publishing companies or the scientific society

The rotation of editors and members of the editorial boards at three to five year intervals should be mandatory The membership should comprise representatives of the major disciplines covered by the papers submitted outside scientists being consulted for assistance on highly specialized subjects Membership on an active properly functioning board of diligent scientists should constitute an honor and provide intellectual pleasure.



14 The Dictator



15 The Stockholder

THE PUBLISHING COMPANY [illegible]
responsibility to science and the [illegible]
that to the stockholders Surely [illegible]
to a profit, but not at the expense [illegible]
in quality or structure of the [illegible]
publications (FIG 15) Journa[illegible]
institutions have the definite [illegible]
completely governed by [illegible]
financial profit. Advertising [illegible]
should conform to accepted [illegible]
initiated and maintained by [illegible]
rather than the board of [illegible]
themselves (FIG 16)



16 The Advertiser

Publishers should constantly work toward improvement in illustrations typesetting paper spacing and other aspects of format to keep abreast of other advances in science and research which assist the investigator in presenting his material more effectively In such endeavors as the publication of monographs in which the publisher and author work alone the integrity of the publisher assumes paramount importance

Considerable improvement is needed in scientific publications particularly in *state medical journals* Today with greater emphasis on political and economic problems they often contain clinical material which has been rejected by the better national journals These local journals, because of the need to fill their progressively thinning issues tend to encourage publication of poor individual case reports and other inferior material Interestingly enough mainly successful clinical procedures enjoy publication and seldom does a retraction of previously published inaccuracies appear Perhaps the state journal which must go to press on schedule with a full issue of clinical papers regardless of quality should be supplanted by a non scientific bulletin containing political commercial and administrative activities of the society and regional rather than state journals should present the limited scientific material of adequate quality

FINALLY THE LAY PRESS should be provided by science and the scientist with accurate reporting of scientific activities in medicine both clinical and experimental Newspaper and magazine reporting today is inadequate because of many factors Sometimes the scientist or physician may permit the reporter because of local pride to imply that his activities are original when actually many others may have been engaged in similar programs long before The hypomanic pseudo-scientist, rather than the humble and conservative scientist directly responsible for the original work tends to provide the material for lay consumption this can only lead to inaccurate and sensational reporting aimed at the reader s emotions and large sales rather than truthful reporting designed for education of the reader (FIG 17) Provisions should be available for the originator of ideas or discoverer himself to furnish such material

KIDNEYS
MAKE
URINE



17 The Sensationalist

18 The Miracle Monger

Opinions impressions ill-conceived ideas and fantasies about scientific and applied medicine should be clearly differentiated from scientific fact and established truth (FIG 18) Competent reporting by the large newspapers or syndicates would require a staff of scientists who would not be misled by the newsworthy names in medicine any more than would a good editorial board Many people who report periodically through the newspapers and magazines of accomplishments in medical science cannot publish the same accomplishments in well established critical scientific journals There is a need for lucid accurate and objective scientific reporting in lay publications

18 The Miracle Monger

Only a brief inventory of the problems of scientific medical writing has been presented with few or no solutions That the present situation is defective and that the problems deserve careful study and correction all will agree Improvement cannot come as a result of controls but only from demanding the highest integrity and performance among all concerned with writing of scientific papers. The fundamental responsibility for the character of scientific papers resides with the investigator author Finally the practice of requiring papers for qualification for membership in certain societies to fill journal issues or to satisfy a demand by certain readers is to be vigorously and actively discouraged Because research is fashionable today and a lengthy personal bibliography is considered an index of scientific ability many feel compelled to engage in these endeavors It is the duty of all to evaluate publications critically and rigidly and to denounce inaccuracies and inferior quality in research and writing

I leave it to you to decide where these criticisms apply if at all Each man in science must judge himself as dispassionately as he should judge his data and their implications It is hoped that these opinions will provoke objective discussion and self-criticism and thus effect improvement

From a study today of scientific papers in medicine one is forced to question the validity of Bacon s statement as applied to all men that Writing maketh an exact man